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DOUGLAS FIR



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A young open-grown Douglas fir tree. Old trees growing in the forest lose their branches on the lower parts of the trunk. On old trees the bark becomes very thick, even up to ten or twelve inches, and so is a splendid protection from fire. The annual cut of Douglas fir in Canada is now exceeded only by that of spruce. It is the only Canadian timber of which large quantities can be secured in the large sizes needed for heavy construction work; and only the best grades of southern, or hard, pine are equal in strength to first-class Douglas fir. It is also a very handsome wood, and so adapted for interior finish, furniture and similar uses.

DOUGLAS FIR

Pseudotsuga taxifolia

Common names: Douglas fir, British Columbia fir, red fir, yellow fir, Douglas spruce, Oregon pine, Oregon spruce.

French names: Sapin de Douglas, Pin de Douglas, Douglas.

The Douglas fir is a western tree. In Canada it ranges from the east slope of the Rocky mountains in Alberta through to the coast in British Columbia. In the United States it grows throughout the Pacific Coast region and the Rocky mountains southward to northwestern Texas.

As will be seen by the list of names above, lumbermen have had considerable difficulty in selecting a name for this tree. In the past it has been called "spruce" and "pine" for export purposes, since to call it "fir" would class it with the true firs (the genus *Abies*) which are totally different in properties and in many respects inferior. Now that it has become more generally known it is usually marketed under the name "Douglas fir." This name it derived from the fact that David Douglas, a Scotch botanist, obtained the seed and planted it in England in 1827.

ANNUAL CONSUMPTION AND PRESENT STAND

The Douglas fir is at present one of Canada's most important woods. It is second only to spruce in the quantity of lumber cut. No other single species is furnishing so much of Canada's lumber. More than 750,000,000 feet board measure are being cut each year, and this cut will doubtless increase with the growing scarcity of large structural timber in Eastern Canada and as the qualities of the wood become more widely known.

A recent survey of the forest resources of British Columbia showed a total stand of approximately 76,000,000,000 feet board measure of Douglas fir. While all of this is not at present commercially accessible, a large proportion is within reasonable distance of water or rail transportation. About 80 per cent of it is situated on Vancouver island and the adjacent mainland.

THE WOOD: QUALITIES AND USES

The wood of the Douglas fir is one of the hardest, heaviest, stiffest, and strongest of the native woods. It also produces the largest structural timber growing in Canada. Great quantities are used in bridge-building, wharf construction and heavy framework of all kinds. The wood is very durable, probably because of its high resin content, and large quantities are used for railway ties and in mining operations. It also provides an excellent material for boat.

scow, and other marine construction. Being practically impervious to water, it is used extensively in the manufacture of wooden conduit pipes, tanks, and silos.

Although the Douglas fir is more widely known as a material for heavy construction, it has properties which enable it to be used in a variety of ways. It makes a hard-wearing floor, especially when laid, with the edge-grain upwards, or "vertical-grained," that is, when the wood has been so sawed that the annual rings lie at right angles, or nearly so, to the top and bottom faces of the board. Well-laid creosoted blocks of Douglas fir provide a long-wearing, noiseless, and dustless pavement for roadways.

There is a marked contrast between the spring and summer rings of growth, and this feature gives the wood an exceedingly pleasing figure, rivalling quarter-sawn oak in beauty when cut at a certain angle to the log. It is, therefore, being used extensively for doors, panelling, base-boards, stair-work, sash, and mouldings. So wide are the uses to which the material can be put that it practically fills all the needs of a house-building wood.

HABIT AND CHARACTERISTICS

The Douglas fir attains the largest size of any tree in Canada, and, with the exception of the redwood of California, is the largest tree on the continent. It grows to an immense size, frequently exceeding six feet in diameter and 200 feet in height. One of the tallest Douglas firs on record had a height of 380 feet. In the Kew Gardens, near London, England, stands a single-piece flag-staff 220 feet high presented by the British Columbia government. This staff was cut from a Douglas fir tree 300 feet high. Trees 15 feet in diameter have been found, and a single tree has been cut that scaled 60,000 feet board measure.

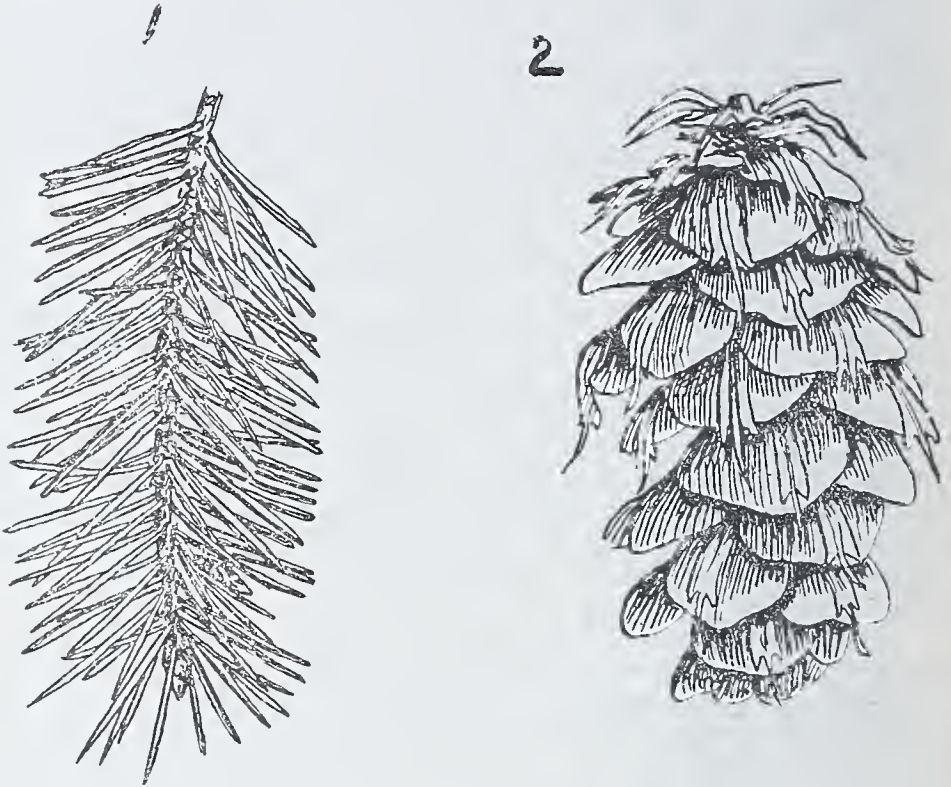
These trees attain a great age. Specimens have been found over 700 years old. The majority of them, however, are overcome by wind, fire, insects, or fungous disease before they reach this age, and comparatively few are found over 400 years old. It might be pointed out, however, that this tree does not suffer from insect pests and fungous diseases to the same extent as its associated species. It is a remarkably healthy tree.

In early life the crown is sharply pyramidal in shape, with the lower branches drooping. Older trees have more or less flattened or round-topped crowns. In old age it is usually free of branches for 70 feet or more and the trunk is straight with very little taper.

The character of the bark varies with age. On young trees it is thin, smooth and shows resin blisters similar to those on the true firs (*Abies*). Later it becomes very thick and deeply furrowed. The Douglas fir has the heaviest bark of any tree in Canada, sometimes 10 to 12 inches thick. The bark makes good fuel, burning readily but more slowly than wood.

The leaves (see Fig. 1) are flattened and pointed, dark-green above, and pale beneath. They are from one to one and one-half inches long. They are attached more or less spirally around the twig, but their narrowed base or stem permits them to arrange themselves on opposite sides of the twig in two ranks or feather-like. This arrangement, however, is not so distinctly two-ranked as in the case of the true firs.

The winter buds are sharp-pointed and free of resin. This distinguishes them from the true firs which have rather blunt or rounded buds covered with resin.



The cones (see Fig. 2) are from 2 to 4½ inches long and hang gracefully from the branches. The cones of the true firs stand erect. The character of the cones is the best means of distinguishing Douglas fir from the other firs. They have a flexible three-pointed bract which is attached to the base of each scale and extends conspicuously about half an inch beyond the scale, giving the cone a feathered appearance.

The seed is borne in pairs behind the scale. Each seed is attached to a triangular-shaped wing. The tree is thus provided with a highly efficient method of scattering its seeds.

Although botanically there is only one species of Douglas fir there are some marked differences in size and general qualities of the trees growing on the mountains of inland British Columbia, as compared with those found in the moister climate of the Coast region. The Coast tree reaches a larger size and is more rapid in growth. It also develops a more open crown, with drooping branches, than does the tree of the interior. Such tests as have been made indicate that the wood of the coast type is stronger than that of the mountain type. The latter type, however, is a hardier tree, being less subject to injury by early and severe frosts when grown outside of its natural range.

REPRODUCTION AND PLANTING

The Douglas fir is a tree of graceful proportions, attractive foliage, and good rate of growth, and might well be used to a greater extent than it is at present for ornamental planting. Where it is desired to cultivate it in Eastern Canada the hardier mountain type is recommended in preference to the coast form.

In British Columbia practically pure stands of Douglas fir are common. It is also found mixed with Western hemlock, Western cedar, Sitka spruce, and other minor species. In such mixtures there is a tendency for the Douglas fir to be replaced by the more shade-enduring species. Under favourable conditions, however, where the seed can reach mineral soil it reproduces prolifically. It thrives best on well-drained soil where the annual precipitation is between 50 and 60 inches and where the climate is moderate and not subject to extremes.

The Douglas fir has attracted considerable interest in Europe and it has for several decades been extensively used in Great Britain and on the continent for reforestation. The coast type has been principally used, and found to make very favourable growth, especially in the British Isles, which have a climate somewhat similar to that of its native habitat. The British Forestry Commission is using this tree extensively for restocking areas cut off during the late war, and the Canadian Government has already supplied them with several tons of seed for this purpose.

ITS FUTURE PROSPECTS

The Douglas fir is one of Canada's most promising export timbers. Although the supply of this timber is situated at some distance from the world's best timber markets, the demand is steadily increasing as its excellent qualities become better known. Promising markets are also developing in Australia, New Zealand, China, Japan, and India, and Canadian stands are very favourably located to supply these. When the present virgin stands are cut it is doubtful if there

will ever again be harvested trees of the large dimensions being cut to-day. However, the Douglas fir reproduces readily, and there is no reason why Canada should not go on indefinitely supplying the world's markets with this wood, provided cutting is wisely regulated so that young growth may be encouraged, and provided also, and above all, that the Dominion and Provincial forest services secure the co-operation of the public in protecting it against fire.

When the supply of the larger timber in the eastern portion of the United States and Canada began to fail, a northern market was developed for the "southern," or "yellow," pines of the Southern States. Considerable quantities of this material have been imported into Canada for heavy structural purposes. With the entry of the Douglas fir in the Eastern markets a long-drawn-out controversy began as to the relative strength-values of these pines and the Douglas fir. A comparison of the government tests which have been compiled in Canada and the United States indicates that only the best grades of one of the species sold as southern pine, namely, longleaf pine, is of a quality equal to first-class Douglas fir. For practically all structural or building work the Douglas fir is superior to much of the material sold as southern pine. Moreover, Douglas fir averages 20 per cent lighter than these pines, a fact of considerable importance in some types of construction.